



# **WATER SUPPLY AND POLLUTION CONTROL**

*Research Inventory  
Active Projects - 1958*

*Prepared by*

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**U. S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE  
Public Health Service**

**Division of Engineering Services and  
Division of Water Supply and Pollution Control**

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## FOREWORD

We are moving forward into an unprecedented era, with a reduced time factor for equating the impact of pollution on our water resources. The type and rapidity of change require much keener vision in anticipating and meeting problems, and our research efforts must be geared accordingly. Our practice has outrun theory in many aspects of knowledge in this field.

We recognize the need for a record of active research projects in water supply and pollution control. The Research Inventory has been prepared to enable scientists and engineers to review the current status of this research and to chart future needs for action.

M. D. Hollis  
Assistant Surgeon General  
Chief Engineer

There is a great need today for more basic knowledge in all areas of water supply and in the protection of water quality. The amount of research underway in this field is small in relation to growing problems; that which is needed will require the combined efforts of researchers everywhere. This inventory of active projects can do much to stimulate expanded programs of water supply and pollution control research which are essential if we are to solve the complex problems of our growing nation.

Gordon E. McCallum, Chief  
Division of Water Supply  
and Pollution Control

## ACKNOWLEDGEMENT

In compiling the basic data for the Research Inventory the Public Health Service was assisted by the American Water Works Association, the Water Pollution Control Federation, the National Technical Task Committee on Industrial Wastes, and others. Grateful acknowledgement is made of the contribution of these organizations in distributing and collecting the questionnaires upon which the Inventory depends.

## INTRODUCTION

Research Inventory No. 1 is a report summarizing data on 280 water supply and pollution control research projects active in the United States during 1958. The information presented was compiled from questionnaires distributed to investigators and administrators known to be conducting or directing research in water, sewage, and industrial wastes.

The Inventory is designed to provide a useful record of research underway, and also to facilitate communication between investigators. It includes a brief report of basic data concerning each research project, a comprehensive index of subjects being studied, and an address list for use in the exchange of information.

It is recognized that the first Research Inventory cannot present a complete listing of all active projects in water supply and pollution control research. However, the Inventory is to be revised and reissued annually, and made as comprehensive as possible. This can be achieved with the assistance of all individuals who can provide additional reports or suggestions.

Individuals who submitted reports for this issue will receive copies of Research Inventory No. 1, and they will be requested to submit reports for the second issue of the Inventory. Others having information or suggestions should correspond with one of the following:

Mr. R. J. Faust, Secretary, American Water Works Association, 2 Park Avenue, New York 16, New York.

Mr. Ralph E. Fuhrman, Executive Secretary, Water Pollution Control Federation, 4435 Wisconsin Avenue, Washington 16, D. C.

Secretary, National Technical Task Committee on Industrial Wastes, Division of Water Supply and Pollution Control, U. S. Public Health Service, Washington 25, D. C.

Research Grants Coordinator, Engineering Resources Program, Division of Engineering Services, U. S. Public Health Service, Washington 25, D.C.



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## HOW TO USE THE RESEARCH INVENTORY

The Research Inventory is divided into three sections. These sections provide a quick guide to the list of research projects, to a reference index, and to sources from which further information may be available.

### SECTION 1. Research Projects - list by States..... Page 3

Basic data, listing briefly:  
WHERE the project is located  
WHAT is being investigated  
WHO is directing the research  
and a record of additional details.  
(Project numbers are reference numbers)

### SECTION 2. Subject Index - by research areas .....Page 37

A reference guide to locating:  
AREAS of related research  
SUBJECTS of research interest  
and references to the project list.  
(Reference numbers refer to Project numbers)

### SECTION 3. Address List - for information .....Page 59

Providing names and addresses of:  
REPORTERS of research projects  
who may be contacted for  
available information.  
(Reference numbers refer to Project numbers)

It is suggested that the introductory page of each section of the Inventory be reviewed. These pages explain the arrangement of information presented. Those using the Inventory may then utilize either the Project List (Section 1) or the Subject Index (Section 2) for locating information. For projects of particular interest he may refer to the Address List (Section 3) to obtain additional information.



# *Research Projects* LIST BY STATES

## PROJECT LIST

The first section of the Research Inventory presents basic data on the 280 research projects reported in the survey. The projects are listed geographically by states and institutions.

Projects are numbered consecutively and the numbers refer also to the Subject Index (Section 2) and the Address List (Section 3).

The Project List includes:

LOCATION - the State, Institution, and City.

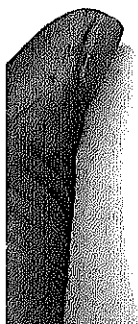
TITLE - a brief description of the research.

INVESTIGATOR - in charge of the project.

TYPE OF RESEARCH - reported by the investigator as basic (bas), basic-applied (bas-appl), or applied (appl).

SUPPORT - listing source of support and amount (when reported); the latter was not required of reporters.

INFORMATION - Detailed information is available when indicated (Info.). It is not available when indicated (No info.) because no publications have been issued, or because there are restrictions on the information which may be disclosed.



- 1 ALABAMA - Alabama Polytechnic Institute, Auburn  
The Feasibility of Domestic Sewage Lagoons for Alabama  
Theodore Jaffe; Bas-Appl; Support: Ala. Poly. Inst.; Info.
- 2 ALABAMA - Alabama Polytechnic Institute, Auburn  
The Treatment of Textile Desizing Wastes  
Theodore Jaffe; Bas-Appl; Support: Ala. Poly. Inst. Engrg.  
Experiment Sta. \$5,570; Info.
- 3 ALASKA - Alaska Water Pollution Control Board, Juneau  
Characteristics of Silver Bay for Control of Pulp Mill Pollution  
E. F. Eldridge; Appl; Support: State, Alaska Lumber & Pulp Co.  
U. S. Fish & Wildlife Serv.; Info.
- 4 ALASKA - Alaska Water Pollution Control Board, Juneau  
Characteristics of Ward Cove as a Measure of Pulp Mill Pollution  
Wm. L. Porter; Appl; Support: State; Info.
- 5 ALASKA - Alaska Water Pollution Control Board, Juneau  
Septic Tanks With Subsurface Disposal Fields Built at Fairbanks  
Chas. Froman; Appl; Support: State; Info.
- 6 ARKANSAS - Arkansas Water Pollution Control Commission, Little Rock  
Automatic Compositing Waste Sampler  
M. L. Wood; Appl; Support: State; No Info.
- 7 ARKANSAS - Arkansas Water Pollution Control Commission, Little Rock  
Automatic Stream Gauging and Recording Device  
M. L. Wood; Appl; Support: State; No Info.
- 8 ARKANSAS - University of Arkansas, Fayetteville  
Variables Affecting Efficiency of Coarse-Grained Water Filters  
Loren R. Heiple; Appl; Support: Winthrop Rockefeller; Info.
- 9 CALIFORNIA - California Institute of Technology, Pasadena  
Resuspension of Flocculent Solids in Sedimentation Basins  
A. C. Ingersoll; Bas-Appl; Support: Fed. RG \$15,158; Info
- 10 CALIFORNIA - California State Water Pollution Control Board, Sacramento  
Current Measurement in Estuarine and Coastal Waters  
J. W. Johnson; Appl; Support: Fed.-State \$7,000; Info.

11	<u>CALIFORNIA</u> - Humboldt State College, Arcata Oceanographic Study Between the Points of Trinidad & Eel Rivers Humboldt State Coll; Appl; Support: Fed.-State \$20,000; Info.	11
12	<u>CALIFORNIA</u> - Humboldt State College, Arcata Dissolved Oxygen Requirements of Aquatic Insects John W. DeWitt; Bas; Support: Fed. RG \$1,955; Info.	12
13	<u>CALIFORNIA</u> - Humboldt State College, Arcata Oceanographic Study of Near-Shore Waters Off Humboldt Bay Geo. H. Allen; Bas; Support: State \$20,000; Info.	13
14	<u>CALIFORNIA</u> - National Cannery Association, Berkeley Water Conservation in Food Canning Walter A. Mercer; Bas-Appl; Support: Fed. RG \$12,500; Info.	14
15	<u>CALIFORNIA</u> - Scripps Institute of Oceanography, La Jolla Effect of Organic Substances from the Sea on Bacteria Dr. Galen E. Jones; Bas; Support: Fed. RG \$9,924; Info.	15
16	<u>CALIFORNIA</u> - University of California, La Jolla Effects of Pollution Upon Kelp University of Calif.; Appl; Support: Fed.-State \$20,000; Info.	16
17	<u>CALIFORNIA</u> - University of California, Berkeley Reaction Kinetics of Anaerobic Fermentation Systems Erman A. Pearson; Bas-Appl; Support: U. of Calif. \$5,000; Info.	17
18	<u>CALIFORNIA</u> - University of California, Berkeley Variables Affecting Removal of ABS by Sewage Treatment Plants P. H. McGauhey; Bas-Appl; Support: Assoc. of Amer. Soap & Glycerine Producers \$17,500; Info.	18
19	<u>CALIFORNIA</u> - University of Southern California, Los Angeles Chromatographic Assay of Extracellular Algal Metabolism Products Robt. C. Merz; Bas; Support: Fed. RG \$19,336; Info.	19
	<u>CALIFORNIA</u> - University of Southern California, Los Angeles Quantity of Oily Substances on Beaches and Near-Shore Waters Robt. C. Merz; Bas-Appl; Support: State \$25,000; Info.	20

21	<u>CALIFORNIA</u> - University of Southern California, Los Angeles A Short Method for Measuring ABS in Water and Sewage Dean Alvah Hall; Bas; Support: Assoc. of Amer. Soap & Glycerine Producers \$5,500; Info.	21
22	<u>CALIFORNIA</u> - University of Southern California, Los Angeles Relationships of Polychaetous Annelids to Marine Pollution John L. Mohr; Bas-Appl; Support: Fed. RG \$8,100; Info.	22
23	<u>CALIFORNIA</u> - University of Southern California, Los Angeles Survey of So. California Shelf for Effects of Waste Discharges Robt. E. Stevenson; Bas-Appl; Support: State \$125,000; Info.	23
24	<u>COLORADO</u> - University of Colorado, Denver Shigella Dysentery Organisms in Contaminated Irrigation Water Wen-Lan Lou Wang; Bas-Appl; Support: Fed. RG \$14,777; Info.	24
25	<u>CONNECTICUT</u> - Wesleyan University, Middletown Automatic Dissolved Oxygen Determination M. G. Burford; Bas-Appl; Support: N. E. Interstate Water Polln. Cont. Comm. \$1,000; Info.	25
26	<u>CONNECTICUT</u> - Wesleyan University, Middletown Automatic Conductivity Meter M. G. Burford; Bas-Appl; Support: State \$1,000; Info.	26
27	<u>CONNECTICUT</u> - Wesleyan University, Middletown Automatic Sample Collector M. G. Burford; Bas-Appl; Support: State \$1,000; Info.	27
28	<u>CONNECTICUT</u> - Wesleyan University, Middletown Effect of Copper on Sludge Digestion M. G. Burford; Bas-Appl; Support: N. E. Interstate Water Polln. Cont. Comm. \$1,000; Info.	28
29	<u>CONNECTICUT</u> - Wesleyan University, Middletown Pollution Reduction in Cotton Mills by Process Chemical Changes M. G. Burford; Bas-Appl; Support: N. E. Interstate Water Polln. Cont. Comm. \$1,000; Info.	29
30	<u>CONNECTICUT</u> - Wesleyan University, Middletown Pollution Reduction in Woolen Mills by Process Chemical Changes M. G. Burford; Bas-Appl; Support: N. E. Interstate Water Polln. Cont. Comm. \$1,000; Info.	30



CONNECTICUT - Wesleyan University, Middletown Pollution Sources from Printed Circuit Plants M. G. Burford; Bas-Appl; Support: N. E. Interstate Water Polln. Cont. Comm. \$1,000; Info.	31	41
CONNECTICUT - Wesleyan University, Middletown Set-up and Control of Experimental Sludge Digestion M. G. Burford; Bas-Appl; Support: N. E. Interstate Water Polln. Cont. Comm. \$1,000; Info.	32	42
CONNECTICUT - Wesleyan University, Middletown Textile Waste Pollution Survey Simplified M. G. Burford; Bas-Appl; Support: N. E. Interstate Water Polln. Cont. Comm. \$1,000; Info.	33	43
CONNECTICUT - Wesleyan University, Middletown Treatment of Tannery Wastes M. G. Burford; Bas-Appl; Support: N. E. Interstate Water Polln. Cont. Comm. \$2,000; Info.	34	44
CONNECTICUT - Wesleyan University, Middletown Use of Versene to Eliminate Effect of Metals on B.O.D. M. G. Burford; Bas-Appl; Support: State; Info.	35	45
CONNECTICUT - Wesleyan University, Middletown Improvement of Analytical Methods M. G. Burford; Bas; Support: State; Info.	36	46
CONNECTICUT - Wesleyan University, Middletown Pilot Treatment Plants for Dairy and Automatic Laundry Wastes M. G. Burford; Bas-Appl; Support: State; Info.	37	47
CONNECTICUT - Wesleyan University, Middletown Properties of Various Coagulating Agents M. G. Burford; Bas-Appl; Support: State; Info.	38	48
Yale University, New Haven Large Treatment of Electroplating and Brass Wastes Walker; Bas-Appl; Support: State; Info.	39	49
CONNECTICUT - Yale University, New Haven Estimating Yields of a Reservoir on a Digital Computer E. L. MacLeman; Appl; Support: MIT Computer Center & New Haven Water Co.; Info.	40	50

CONNECTICUT - Yale University, New Haven

Lake Whitney Sanitary Conditions Related to Lab Examinations  
E. L. MacLeman; Bas-Appl; Support: New Haven Water Co.; Info.

41

DELAWARE - University of Delaware, Newark

Settling Properties of Sludges  
V. C. Behn; Bas; Support: Fed. NSF \$1,000; Info.

42

DELAWARE - University of Delaware, Newark

Storm Drainage Research Project  
Paul Bock; Appl; Support: State \$13,000; Info.

43

FLORIDA - University of Florida, Gainesville

Comprehensive Study of Water Coagulation  
A. P. Black; Bas; Support: Fed. RG \$19,527; Info.

44

FLORIDA - University of Florida, Gainesville

Ion Exchange Resins to Remove Fluoride Ion from Drinking Water  
A. P. Black; Bas; Support: Fed. RG \$5,770; Info.

45

FLORIDA - University of Florida, Gainesville

Acid Intermediates Occurring During Anaerobic Fermentation  
A. M. Buswell; Appl; Support: Fed. RG \$9,027; Info.

46

FLORIDA - University of Florida, Gainesville

Bacterial Oxidation of Nitrite  
A. M. Buswell; Bas-Appl; Support: Fed. RG \$15,352; Info.

47

FLORIDA - University of Florida, Gainesville

Relation Between Interfacial Hydration and Freezing  
A. M. Buswell; Bas; Support: Fed. RG \$16,790; Info.

48

FLORIDA - University of Florida, Gainesville

Anti-Pollution and Sewage Disposal for Florida Communities  
F. W. Gilcreas; Appl; Support: State \$10,000; Info.

49

FLORIDA - University of Florida, Gainesville

Secondary Sewage Treatment Study Using Radioactive Tracers  
F. W. Gilcreas; Bas; Support: Fed. RG \$18,112; Info.

50

51	<u>FLORIDA</u> - University of Florida, Gainesville Dispersion and Effects of Industrial Airborne Wastes E. R. Hendrickson; Bas; Support: Fed. RG \$20,215; Info.	51
52	<u>FLORIDA</u> - University of Florida, Gainesville Aspects of Radiation Acquired by Fresh-Water Microorganisms Jas. B. Lackey; Bas; Support: Fed. AEC \$10,860; Info.	52
53	<u>FLORIDA</u> - University of Florida, Gainesville Taxonomy and Ecology of Iron and Sulfur Bacteria Jas. B. Lackey; Bas; Support: Fed. RG \$14,835; Info.	53
54	<u>GEORGIA</u> - Georgia Institute of Technology, Atlanta Chicken Processing Waste Treatment Robt. S. Ingols; Bas-Appl; Support: State; Info.	54
55	<u>GEORGIA</u> - University of Georgia, Athens Effect of Oxygen Tension on Fish Common to the Southern U. S. Donald C. Scott; Bas; Support: Natl. Council for Stream Improvement; \$10,450; Info.	55
56	<u>ILLINOIS</u> - Chicago Department of Water and Sewers, Chicago Coagulating Water With Ferrous Sulfate Liquid From Steel Mills John R. Baylis; Appl Support: Local; Info.	56
57	<u>ILLINOIS</u> - Chicago Department of Water and Sewers, Chicago Corrosion of Cast Iron Water Pipe John R. Baylis; Appl; Support: Local; Info.	57
58	<u>ILLINOIS</u> - Chicago Department of Water and Sewers, Chicago Detection of Coliform Bacteria With the Electron Microscope LeRoy E. Scarce; Appl; Support: Local; Info.	58
59	<u>ILLINOIS</u> - Chicago Department of Water and Sewers, Chicago Sand Bed Studies and Gravel Movement in Filter Bed Maintenance John R. Baylis; Appl; Support: Local; Info.	59
60	<u>ILLINOIS</u> - Chicago Department of Water and Sewers, Chicago High Rate Filtration John R. Baylis; Appl; Support: Local; Info.	60

61

ILLINOIS - Chicago Department of Water and Sewers, Chicago  
Filtered Water Coagulated Material Detection by Membrane Filter  
Jas. C. Vaughn; Appl; Support: Local; Info.

62

ILLINOIS - Chicago Department of Water and Sewers, Chicago  
Monitoring Water for Radioactivity  
John R. Baylis; Appl; Support: Local; Info.

63

ILLINOIS - Chicago Department of Water and Sewers, Chicago  
Ridged Gelatinous Coating in Water Pipes Causing Friction Loss  
John R. Baylis; Bas-Appl; Support: Local; Info.

64

ILLINOIS - Illinois Institute of Technology, Chicago  
Effect of Ammonium Ion Concentration on Biological Oxidation  
Richard Pavia; Bas-Appl; Support: Ill. Inst. of Tech.; Info.

65

ILLINOIS - Illinois Institute of Technology, Chicago  
Agent in Lake Michigan Inhibiting E. Coli and Related Bacteria  
L. R. Hedrick; Bas; Support: Fed. RG \$9,155; Info.

66

ILLINOIS - Illinois State Water Survey, Urbana  
Chromatographic Identification of Organic Acids in Water  
T. E. Larson; Bas-Appl; Support: State; Info.

67

ILLINOIS - Illinois State Water Survey, Urbana  
Reservoir Sediment and Watershed Factors at Springfield Plain  
J. B. Stall; Bas-Appl; Support: Fed-State; Info.

68

ILLINOIS - Illinois State Water Survey, Urbana  
Drop-Inlet Spillway Research  
H. W. Humphreys; Bas-Appl; Support: State; Info

69

ILLINOIS - Illinois State Water Survey, Urbana  
Evaporation Suppression from Water Surfaces  
W. J. Roberts; Appl; Support: State; Info.

70

ILLINOIS - Illinois State Water Survey, Urbana  
Ground-Water Occurrence, Yield & Movement in American Bottom  
H. F. Smith; Bas-Appl; Support: State; Info.

71 - 80

71	<p><u>ILLINOIS</u> - Illinois State Water Survey, Urbana Ground-Water Recharge in Peoria Robt. H. Harmeson; Bas-Appl; Support: State; Info.</p>	71
72	<p><u>ILLINOIS</u> - Illinois State Water Survey, Urbana Loss of Carrying Capacity in Water Mains Due to Water Quality T. E. Larson; Bas-Appl; Support: Fed. RG \$20,000; Info.</p>	72
73	<p><u>ILLINOIS</u> - Illinois State Water Survey, Urbana Mounts for Low-Level Radioactivity Counting in Water Solids T. E. Larson; Appl; Support: State; Info.</p>	73
74	<p><u>ILLINOIS</u> - Illinois State Water Survey, Urbana Study of Surface Precipitation Using Radar Instrumentation Glenn Stout; Bas-Appl; Support: U. S. Army Signal Corps; Info.</p>	74
75	<p><u>ILLINOIS</u> - Sanitary District, Greater Peoria Anaerobic Contact Process for Domestic Sewage Treatment Leon Kraus; Appl; Support: Fed. \$5,500; Info.</p>	75
76	<p><u>ILLINOIS</u> - University of Illinois, Urbana Biological Treatment of Petrochemical Wastes R. S. Engelbrecht; Bas-Appl; Support: Fed. RG \$8,000; Info.</p>	76
77	<p><u>ILLINOIS</u> - Wilson &amp; Company, Inc., Chicago Anaerobic Digestion Mixed Liquor Separation Studies A. J. Steffen; Appl; Support: Wilson &amp; Co.; Info.</p>	77
78	<p><u>INDIANA</u> - The Hays Corporation, Michigan City Development of Dissolved Oxygen Analyzer W. H. Pugsley; Appl; Support: Fed. \$14,300; Info.</p>	78
79	<p><u>INDIANA</u> - Purdue University, Lafayette Treatment of Strawboard and Semi-Chemical Bleaching Liquors Don E. Bloodgood; Appl; Support: Natl. Council for Stream Improvement; \$3,348; Info.</p>	79
80	<p><u>INDIANA</u> - Purdue University, Lafayette Contaminants in Liquid Chlorine and Methods for Their Estimation M. G. Mellon; Bas-Appl; Support: Fed. RG \$10,178; Info.</p>	80

81	<u>INDIANA</u> - Purdue University, Lafayette Aerobic Digestion of Sludge Don E. Bloodgood; Bas; Support: Purdue U.; Info.	81
82	<u>INDIANA</u> - Purdue University, Lafayette Effect of Temperature on Digestion Don E. Bloodgood; Bas; Support: Purdue U.; Info.	82
83	<u>INDIANA</u> - Purdue University, Lafayette Mechanism of Hydrogen Sulfide Production G. H. Teletzke; Bas; Support: Purdue U.; Info.	83
84	<u>INDIANA</u> - Purdue University, Lafayette Semi-Chemical Bleaching Wastes Research Don E. Bloodgood; Bas; Support: Natl. Council for Stream Improvement \$5,000; Info.	84
85	<u>INDIANA</u> - Purdue University, Lafayette Trickling Filter Studies Don E. Bloodgood; Bas; Support: Group of interested Manufacturers \$3,000; Info.	85
86	<u>INDIANA</u> - Purdue University, Lafayette Volatile Acid Formation During Sewage Sludge Digestion G. H. Teletzke; Bas; Support: Fed. RG \$4,760; Info.	86
87	<u>INDIANA</u> - Purdue University, Lafayette Effect of Disinfection Dosages on Coal-Tar Lined Cast Iron Pipe H. R. Wilke; Bas-Appl; Support: Clow Pipe Co. \$20,000; Info.	87
88	<u>INDIANA</u> - Purdue University, Lafayette Farm Pond Water Treatment for Domestic Use H. R. Wilke; Appl; Support: Fed. RG \$4,364; Info.	88
89	<u>IOWA</u> - Iowa State College, Ames Diatomite Filtration of Municipal Water Supplies E. R. Baumann; Bas-Appl; Support: Iowa State Coll. & Everpure, Inc. \$4,500; Info.	89
90	<u>IOWA</u> - Iowa State College, Ames Plant-Scale Study of Preaeration in Sewage Treatment E. R. Baumann; Bas-Appl; Support: Fed. RG \$13,900; Info.	90

91	<u>IOWA</u> - Iowa State College, Ames Superchlorination-Dechlorination Studies on Small Water Supplies E. R. Baumann; Bas-Appl; Support: Iowa State Coll. & Everpure, Inc. \$4,500; Info.	91
92	<u>IOWA</u> - Rath Packing Company, Waterloo Waste Disposal R. C. Burrell; Appl; Support: Roth Packing Co. \$10,000; Info.	92
93	<u>KANSAS</u> - Kansas State Board of Health, Topeka Sources and Seasonal Variations of Nitrates in Water Supply Wells Dwight F. Metzler; Bas-Appl; Support: Fed. RG \$1,840; Info.	93
94	<u>KANSAS</u> - Kansas State Board of Health, Topeka Coliform Organisms and Enterococci as Indices of Water Quality Cassandra Ritter; Appl; Support: Fed. RG \$6,095; Info.	94
95	<u>KANSAS</u> - Kansas State College, Manhattan Filtering Farm Pond Water T. H. Lord; Appl; Support: Kan. State Coll.; Info.	95
96	<u>KANSAS</u> - University of Kansas, Lawrence Design Criteria for Turnpike Sewage Treatment Plants R. T. Page; Bas-Appl; Support: State; Info.	96
97	<u>KANSAS</u> - University of Kansas, Lawrence Synthetic Detergent Removal in Municipal Water Supplies R. T. Page; Bas-Appl; Support: U. of Kan.; Info.	97
98	<u>KENTUCKY</u> - University of Kentucky, Lexington Industrial Waste Treatment and Effects on Public Waters Sam C. Hite; Appl; Support: State \$10,000; No info.	98
99	<u>KENTUCKY</u> - University of Louisville, Louisville Aquatic-Life Resources Project for the Ohio River Wm. M. Clay; Appl; Support: State \$25,000; Info.	99
100	<u>KENTUCKY</u> - University of Louisville, Louisville Radioactivity Monitor Project Along the Ohio River Wm. M. Clay; Bas-Appl; Support: State \$12,000; Info.	100

101	<u>LOUISIANA</u> - Louisiana State University, Baton Rouge Treatment of Kraft Mill Wastes for Removal of Color Herbert F. Berger; Appl; Support: Natl. Council for Stream Improvement \$8,985; Info.	101
102	<u>LOUISIANA</u> - Louisiana State University, Baton Rouge Dissolved Oxygen Distribution Profiles Under Various Conditions Arthur G. Keller; Bas-Appl; Support: La. Sugar Producers Waste Control Council \$2,400; Info.	102
103	<u>LOUISIANA</u> - Louisiana Wildlife and Fisheries Commission, Baton Rouge Biological and Chemical Assay of Louisiana Sugar Mill Wastes Robt. A. LaFleur; Bas-Appl; Support: State; Info.	103
104	<u>LOUISIANA</u> - Louisiana Wildlife and Fisheries Commission, Baton Rouge Survey of the Mississippi River in the Vicinity of Baton Rouge Richard T. Gregg; Bas; Support: State \$20,000; Info.	104
105	<u>LOUISIANA</u> - Louisiana Wildlife and Fisheries Commission, Baton Rouge Statewide Water Quality Inventory K. E. Biglane; Bas; Support: State; Info.	105
106	<u>LOUISIANA</u> - Northwestern State College, Natchitoches Distribution of Tendipedidae and Domestic Sewage Pollution Jas. E. Sublette; Bas; Support: Fed. RG \$3,370; Info.	106
107	<u>MAINE</u> - Bates College, Lewiston Control of Hydrogen Sulfide Production in Surface Waters Walter A. Lawrence; Bas; Support: Natl. Council for Stream Improvement; Info.	107
108	<u>MAINE</u> - University of Maine, Orono Development of More Efficient Oxygen Transfer Techniques S. A. Zieminski; Bas; Support: Natl. Council for Stream Improvement \$10,484; Info.	108
109	<u>MAINE</u> - University of Maine, Orono Treatment of Protein Water From Potato Starch Manufacture Seymour J. Ryckman; Bas-Appl; Support: State and Potato Starch Manufactures, Inc. \$4,000; Info.	109
110	<u>MARYLAND</u> - Johns Hopkins University, Baltimore Artificial Clays for the Fixation of Radioactive Nuclides Walter Patrick; Bas-Appl; Support: Fed. AEC \$25,000; Info.	110



<u>MARYLAND</u> - Johns Hopkins University, Baltimore Fission Waste Disposal by Adsorption of Isotopes on Soil-Sawdust John C. Geyer; Bas-Appl; Support: Fed. AEC \$25,000; Info.	111
<u>MARYLAND</u> - Johns Hopkins University, Baltimore Storm Drainage Inlet Design and Runoff from Urban Areas John C. Geyer; Bas-Appl; Support: Fed-Local \$30,000; Info.	112
<u>MARYLAND</u> - Johns Hopkins University, Baltimore Transportation of Radioactive Wastes John C. Geyer; Bas-Appl; Support: Fed. AEC \$25,000; Info.	113
<u>MARYLAND</u> - Johns Hopkins University, Baltimore Low-Flow Augmentation for Stream-Pollution Abatement C. H. Hull; Appl Support: Fed. RG \$21,045; Info.	114
<u>MARYLAND</u> - Johns Hopkins University, Baltimore Tidal Mixing and Pollution Assimilation, St. Johns River, Florida John C. Geyer; Bas-Appl; Support: City of Jacksonville, Fla.; Info.	115
<u>MARYLAND</u> - Johns Hopkins University, Baltimore Removal of ABS from Potable Water by Treatment Modification Chas. E. Renn; Bas-Appl; Support: Assoc. of Amer. Soap & Glycerine Producers \$12,252; Info.	116
<u>MARYLAND</u> - Johns Hopkins University, Baltimore Improvement of Molecular Membrane Bacteriological Techniques Chas. E. Renn; Bas-Appl; Support: Salem-Brosius, Inc.; Info.	117
<u>MARYLAND</u> - Johns Hopkins University, Baltimore Silver Ion for Disinfection of Private Water Supplies Chas. E. Renn; Bas-Appl; Support: Salem-Brosius, Inc.; Info.	118
<u>MARYLAND</u> - Maryland State Department of Health, Baltimore Pollution and Pollution Control for Selected Streams Thos. W. Shives; Appl; Support: State \$50,000; Info.	119
<u>MASSACHUSETTS</u> - Harvard University, Cambridge Solubility of Oxygen in Water J. C. Morris; Bas-Appl; Support: Fed. \$5,000; Info.	120

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| 121 | <u>MASSACHUSETTS</u> - Massachusetts Institute of Technology, Cambridge<br>Biological Treatability of Organic Industrial Wastes<br>Jas. M. Symons; Bas-Appl; Support: MIT; Info.  |
| 122 | <u>MASSACHUSETTS</u> - Massachusetts Institute of Technology, Cambridge<br>Radioactive Tracer Study of Endogenous Metabolism<br>Jas. M. Symons; Bas-Appl; Support: Fed. RG \$15,142; Info.  |
| 123 | <u>MASSACHUSETTS</u> - Massachusetts Institute of Technology, Cambridge<br>Biochemical Characteristics of Synthetic Detergents<br>Ross E. McKinney; Bas-Appl; Support: Fed. RG \$8,500; Info.   |
| 124 | <u>MASSACHUSETTS</u> - Massachusetts Institute of Technology, Cambridge<br>Corrosion Control in Potable Water Systems<br>Rolf Eliassen; Bas-Appl; Support: Amer. Iron & Steel Inst., AWWA,<br>and John B. Pierce Foundation \$10,000; Info. |
| 125 | <u>MASSACHUSETTS</u> - Massachusetts Institute of Technology, Cambridge<br>Disposal of Radioactive Wastes from Nuclear Reactor Fuels<br>Rolf Eliassen; Bas-Appl; Support: Fed. AEC \$36,000; Info.  |
| 126 | <u>MASSACHUSETTS</u> - Massachusetts Institute of Technology, Cambridge<br>Nitrogen in Aerobic Stabilization of Organic Wastes in Streams<br>Ross E. McKinney; Bas-Appl; Support: Fed. RG \$5,000; Info.                                    |
| 127 | <u>MASSACHUSETTS</u> - Massachusetts Institute of Technology, Cambridge<br>Survival of Pathogenic Organisms in H<br>Clair N. Sawyer; Bas-Appl; Support: F   |
| 128 | <u>MICHIGAN</u> - Kalamazoo College, K<br>Removal and Disposal of Sus<br>Russell O. Blosser; Bas; Sup<br>Improvement \$1,200; Info.   |
| 129 | <u>MICHIGAN</u> - Michigan State Unive<br>Toxicity of Cadmium and Hex<br>R. U. Byerrum; Bas; Support  |
| 130 | <u>MICHIGAN</u> - Michigan State Unive<br>Protective Coatings in Wate<br>Robt. F. McCauley; Bas-Appl  |

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MICHIGAN - Michigan State University, East Lansing  
Substrate Concentration and Respiration Under Continuous Flow  
Karl L. Schulze; Bas; Support: Mich. State U. Engrg.  
Experiment Sta. \$4,000; Info.

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MICHIGAN - Michigan State University, East Lansing  
Vertical Screen Trickling Filter For Treating Wastes  
Karl L. Schulze; Bas-Appl; Support: Mich. State U. Engrg.  
Experiment Sta. \$6,000; Info.

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MICHIGAN - Michigan State University, East Lansing  
Fertilization and Primary Production of a Warm Water Stream  
R. C. Ball; Bas; Support: State \$3,580; Info.

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MICHIGAN - University of Michigan, Ann Arbor  
Drought Flow Characteristics of Michigan Streams  
C. J. Velz; Appl; Support: State \$7,000; Info.

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MICHIGAN - University of Michigan, Ann Arbor  
Role of Substrate in Stream Fauna Distribution  
Geo. H. Lauff; Bas; Support: Fed. RG \$7,577; Info.

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136

MICHIGAN - University of Michigan, Ann Arbor  
Study of Various Aspects of the Great Lakes  
David C. Chandler; Bas-Appl; Support: Fed. NSF and U. of Mich.;  
Info.

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137

MICHIGAN - University of Michigan, Ann Arbor  
Stream Analysis and Hydrology  
C. J. Velz; Bas-Appl; Support: Natl. Council for Stream  
Improvement \$4,266; Info.

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MICHIGAN - University of Michigan, Ann Arbor  
Use of Algae in the Treatment of Sewage Effluents  
J. A. Borchardt; Bas-Appl; Support: Fed RG \$15,074; Info.

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139

MICHIGAN - Wayne State University, Detroit  
Determining Radioactive Isotopes in Water and Sewage  
Richard B. Hahn; Bas-Appl; Support: Fed. RG \$8,500; Info.

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140

MINNESOTA - University of Minn. School of Public Health, Minneapolis  
Study of Limnology, Lake Superior  
H. M. Bosch; Bas-Appl; Support: State \$10,000; Info.

140

141

MISSISSIPPI - Mississippi State University, State College  
Sewage Lagoons  
Howard K. Williford; Bas-Appl; Support: State and Miss. State U.  
\$15,000; No info.

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142

NEW HAMPSHIRE - University of New Hampshire, Durham  
Enterococci as Indicators of Pollution Using Membrane Filter  
L. W. Slanetz; Bas-Appl; Support: Fed. RG \$5,469; Info.

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NEW JERSEY - Rutgers University, New Brunswick  
Activated Sludge Studies  
H. Heukelekian; Bas; Support: Fed. RG \$5,778; Info.

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NEW JERSEY - Rutgers University, New Brunswick  
B. O. D. of Pure Organic Compounds  
H. Heukelekian; Bas; Support: Fed. RG \$4,428; Info.

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NEW JERSEY - Rutgers University, New Brunswick  
Fatty Acid Transformation in Anaerobic Digestion By C14 Tagging  
H. Heukelekian; Bas; Support: John Van Nostrand Dorr Fellowship \$2,400; Info.

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146

NEW JERSEY - Rutgers University, New Brunswick  
Cyanogen Chloride for Determining Residual Chlorine in Wastes  
H. Heukelekian; Bas; Support: Fed. RG \$4,915; Info.

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NEW JERSEY - Rutgers University, New Brunswick  
Household Well Water Supplies  
H. Heukelekian; Bas; Support: Fed. RG \$3,929; Info.

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148

NEW JERSEY - Rutgers University, New Brunswick  
Lime Neutralization of Dilute Acid Wastes  
H. Heukelekian; Bas; Support: Natl. Lime Assoc. \$4,000; Info.

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149

NEW JERSEY - Rutgers University, New Brunswick  
Analysis of Organic Matter in Soluble Fractions of Sewage  
H. Heukelekian; Bas; Support: Fed. RG \$5,462; Info.

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150

NEW JERSEY - Rutgers University, New Brunswick  
Slime Infestation in Streams  
H. Heukelekian; Bas; Support: Natl. Council for Stream Improvement \$4,800; Info.

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151	<u>NEW JERSEY</u> - Rutgers University, New Brunswick Stream Reaeration and Deoxygenation H. Heukelekian; Bas; Support: Fed. RG \$4,571; Info.	151
152	<u>NEW JERSEY</u> - Rutgers University, New Brunswick Studies on Beggiatoa H. Heukelekian; Bas; Support: Fed. RG \$4,312; Info.	152
153	<u>NEW JERSEY</u> - Rutgers University, New Brunswick Trunk Sewer Effects on the Biota of Raritan Bay H. H. Haskin and E. T. Moul; Bas; Support: Fed. RG; Info.	153
154	<u>NEW MEXICO</u> - N. M. College of Agr. and Mechanic Arts, State College Aerobic Digestion in the Liquid State J. W. Clark; Bas; Support: Fed. RG \$7,500; Info.	154
155	<u>NEW YORK</u> - Assoc. of American Soap and Glycerine Producers, New York Analysis for Synthetic Detergents ABS in Sewage Ralph House; Bas; Support: Cooperating Companies; Info.	155
156	<u>NEW YORK</u> - Assoc. of American Soap and Glycerine Producers, New York Analysis for Phosphates in Water and in Sewage M. V. Trexler; Bas; Support: Cooperating Companies; Info.	156
157	<u>NEW YORK</u> - Columbia University, New York Dispersion in Flow-Thru Porous Media Eugene Simpson; Bas; Support: Fed. U.S. Geological Survey; Info.	157
158	<u>NEW YORK</u> - Columbia University, New York Applications of Gamma Radiation to Pulping Effluent Treatment Ernest J. Henley; Bas; Support: Natl. Council for Stream Improvement \$2,000; Info.	158
159	<u>NEW YORK</u> - Cornell University, Ithaca Factors Governing the Fate of Surfactants in Water Chas. D. Gates; Bas-Appl; Support: Fed. RG \$5,129; Info.	159
160	<u>NEW YORK</u> - Cornell University, Ithaca Treatment of Duck Farm Wastes Chas. D. Gates; Appl; Support: State \$6,000; Info.	160

161	<u>NEW YORK</u> - Haskins Laboratories, New York Nutritional Studies on Planktonic Algae Luigi Provasoli; Bas; Support: Fed. RG \$14,000; Info.	161
162	<u>NEW YORK</u> - C. W. Lauman & Company, Beth Page, Long Island Detergent Wastes From Laundries in Ground Waters of Long Island C. W. Lauman Co.; Appl; Support: State \$5,000; Info.	162
163	<u>NEW YORK</u> - Manhattan College, Riverdale Treatment of Organic Waste in Aerated Lagoons Manhattan College; Bas-Appl; Support: State \$4,750; Info.	163
164	<u>NEW YORK</u> - Manhattan College, Riverdale Statistical Analysis on Drought Flows in New York State Manhattan College; Appl; Support: State \$3,185; Info.	164
165	<u>NEW YORK</u> - Manhattan College, Riverdale Removal of Synthetic Detergents from Water and Wastes Manhattan College; Bas-Appl; Support: State \$4,750; Info.	165
166	<u>NEW YORK</u> - Manhattan College, Riverdale Statistical Analysis of Drought Flows in Rivers of New York State Donald J. O'Connor; Bas-Appl; Support: State \$6,300; Info.	166
167	<u>NEW YORK</u> - Manhattan College, Riverdale Effect of Physical and Chem <sup>ical</sup> Donald J. O'Connor; Bas-App	
168	<u>NEW YORK</u> - New York State Conservation Department Effect of Pleasure Craft Waste State Conservation Department	
169	<u>NEW YORK</u> - New York University, Effectiveness of Various Types of Sewage Treatment N. Y. U.; Appl; Support: State	
170	<u>NEW YORK</u> - New York University, Controlled Sewage Filtration Wm. T. Ingram; Bas-Appl; Support: State	

171	<u>NEW YORK</u> - New York University, New York Method for Determination of Nitrate Nitrogen in Sewage Gail P. Edwards; Bas; Support: Fed. RG \$6,900; Info.	171
172	<u>NEW YORK</u> - New York University, New York Effect of Synthetic Detergents on the Activated Sludge Process Gail P. Edwards; Bas; Support: Fed. RG \$7,590; Info.	172
173	<u>NEW YORK</u> - New York University, New York Mechanism of Oxygen Absorption in Aeration Processes Wm. E. Dobbins; Bas; Support: Fed. RG \$9,000; Info.	173
174	<u>NEW YORK</u> - Syracuse University, Syracuse Factors in Construction and Operation of Sewage Oxidation Ponds Syracuse U.; Bas-Appl; Support: State \$9,500; Info.	174
175	<u>NORTH CAROLINA</u> - North Carolina State College, Raleigh Fish Population Related to Pulp Mill Locations B. B. Brandt; Bas; Support: Natl. Council for Stream Improvement; Info.	175
176	<u>NORTH CAROLINA</u> - North Carolina State College, Raleigh Measurement of Color in Streams C. Smallwood; Bas-Appl; Support: Fed. RG \$9,000; Info.	176
177	<u>NORTH CAROLINA</u> - North Carolina State College, Raleigh Radio-Tracers in Hydraulics of Sewage Plants C. Smallwood; Bas-Appl; Support: N. C. State College; Info.	177
178	<u>NORTH CAROLINA</u> - University of North Carolina, Chapel Hill Cholinesterase Activity of Fish Brain Tissue Chas. M. Weiss; Bas; Support: Fed. RG \$6,463; Info.	178
179	<u>NORTH CAROLINA</u> - University of North Carolina, Chapel Hill Kinetics and Mechanism of Reactions Involving Chlorine Dioxide Marvin L. Granstrom; Bas; Support: Fed. NSF; Info.	179
180	<u>NORTH CAROLINA</u> - University of North Carolina, Chapel Hill Oxygen in Waste Treatment Daniel A. Okun; Bas; Support: Fed. RG \$8,963; Info.	180

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| 181 | <u>NORTH CAROLINA</u> - University of North Carolina, Chapel Hill<br>Coagulation of Colloids Having Hydroxyl, Amino or Carboxyl Groups<br>Marvin L. Granstrom; Bas; Support: Fed. RG \$5,640; Info.                        |
| 182 | <u>NORTH CAROLINA</u> - University of North Carolina, Chapel Hill<br>Reoxygenation of Benthic Sludge Load of Third Fork Creek<br>Chas. M. Weiss; Bas-Appl; Support: U. of N. C. Research Council<br>\$465; No info.        |
| 183 | <u>NORTH CAROLINA</u> - University of North Carolina, Chapel Hill<br>Treatment of Liquid Wastes from Semi-Chemical Pulping Process<br>Daniel A. Okun; Bas-Appl; Support: The Mead Corp. \$9,200;<br>No info.               |
| 184 | <u>OHIO</u> - Distillers Feed Research Council, Cincinnati<br>Recovery of Wastes in Distillers Dried Feeds<br>L. E. Carpenter; Appl; Support: Cooperating Distilleries; Info.  |
| 185 | <u>OHIO</u> - Kenyon College, Gambier<br>Spectrophotometric Determination of Ions in Wastes and Water<br>J. M. Pappenhagen; Bas-Appl; Support: Fed. RG \$2,875; Info.  |
| 186 | <u>OHIO</u> - Ohio River Valley Water Sanitation Commission, Cincinnati<br>Continuous Recording and Transmission of Water Quality Data<br>Ohio River Valley Water Sanitation Comm; Appl; Support: State<br>\$31,500; Info. |
| 187 | <u>OHIO</u> - Ohio State University, Columbus<br>Quality and Effect of Treatment<br>Glenn Schwab; Appl; Support.   |
| 188 | <u>OHIO</u> - Ohio State University,<br>Infectious Hepatitis Spec<br>Jackson Riddle; Bas; Supp   |
| 189 | <u>OHIO</u> - Ohio State University,<br>Small Scale Anaerobic-Aer<br>K. W. Cosens; Appl; Suppo   |
| 190 | <u>OHIO</u> - Ohio State University,<br>Acid Mine Drainage Studie<br>Robt. F. Baker; Bas-Appl;<br>Natural Resources Institu  |



191	<u>OHIO</u> - Ohio State University, Columbus Toxic Waste Studies - Heavy Metals Wastes W. D. Sheets; Bas-Appl; Support: State \$28,000; Info	191
192	<u>OHIO</u> - Ohio State University, Columbus Waste Water Reclamation Edw. Q. Moulton; Bas-Appl; Support: Ohio State U. Engrg Experiment Sta. \$5,000; Info.	192
193	<u>OHIO</u> - Ohio State University, Columbus Physiology of Aquatic Bacteria in Acid Mine Drainage Chester I. Randles; Bas; Support: Fed. RG \$7,446; Info.	193
194	<u>OHIO</u> - Robert A. Taft Sanitary Engineering Center, Cincinnati Design Criteria for Seepage Pits and Seepage Beds T. W. Bendixen; Appl; Support: Fed. FHA \$168,000; Info.	194
195	<u>OHIO</u> - Robert A. Taft Sanitary Engineering Center, Cincinnati Serological Identification of Waste Components R. L. Bunch; Bas-Appl; Support: Fed. U. S. Army \$25,500; Info.	195
196	<u>OHIO</u> - Robert A. Taft Sanitary Engineering Center, Cincinnati Improvement of Analysis of Organics in Polluted Water F. M. Middleton; Bas-Appl; Support: Fed. \$45,000; Info.	196
197	<u>OHIO</u> - Robert A. Taft Sanitary Engineering Center, Cincinnati Pollutional Strength of Significant Recurrent Industrial Wastes Gerald N. McDermott; Bas-Appl; Support: Fed. \$4,000; Info.	197
198	<u>OHIO</u> - Robert A. Taft Sanitary Engineering Center, Cincinnati Behavior of Nitriles in Surface Water and Treatment Systems F. J. Ludzack; Bas-Appl; Support: Fed. \$18,000; Info.	198
199	<u>OHIO</u> - Robert A. Taft Sanitary Engineering Center, Cincinnati Effect of Heavy Metals on Sewage Treatment Processes W. A. Moore; Bas-Appl; Support: Fed. \$50,000; Info.	199
200	<u>OHIO</u> - Robert A. Taft Sanitary Engineering Center, Cincinnati Practical Methods for Application of Bioassays Croswell Henderson; Bas-Appl; Support: Fed. \$25,000; Info.	200

201	<u>OHIO</u> - Robert A. Taft Sanitary Engineering Center, Cincinnati Significance of Protozoal and Metazoal Organisms in Water S. L. Chang; Bas-Appl; Support: Fed. \$14,000; Info.	201
202	<u>OHIO</u> - Robert A. Taft Sanitary Engineering Center, Cincinnati Enumeration of Bacterial Indicators of Contamination Harold F. Clark; Bas-Appl; Support: Fed. \$57,000; Info.	202
203	<u>OHIO</u> - Robert A. Taft Sanitary Engineering Center, Cincinnati Role of Fungi in Environmental Sanitation Wm. B. Cooke; Bas-Appl; Support: Fed. \$17,000; Info.	203
204	<u>OHIO</u> - Robert A. Taft Sanitary Engineering Center, Cincinnati Role of Water in the Transmission of Viral Diseases Norman A. Clarke; Bas-Appl; Support: Fed. \$45,000; Info.	204
205	<u>OHIO</u> - Robert A. Taft Sanitary Engineering Center, Cincinnati Efficiency of Silver as a Germicidal Agent Cecil W. Chambers; Bas-Appl; Support: Fed. \$21,000; Info.	205
206	<u>OHIO</u> - Robert A. Taft Sanitary Engineering Center, Cincinnati Microorganisms to Degrade Specific Industrial Waste Components H. H. Tabak; Bas; Support: Fed. \$12,000; Info.	206
207	<u>OHIO</u> - Robert A. Taft Sanitary Engineering Center, Cincinnati Analysis of Taste and Odor Compounds from Algae and Actinomycetes C. M. Palmer; Bas-Appl; Support: Fed. \$35,000; Info.	207
208	<u>OHIO</u> - Robert A. Taft Sanitary Engineering Center, Cincinnati Effects of Impoundments on Water Quality F. W. Kittrell; Bas-Appl; Support: Fed. \$38,000; Info.	208
209	<u>OHIO</u> - Robert A. Taft Sanitary Engineering Center, Cincinnati Sewage Treatment by Stabilization Ponds W. W. Towne; Bas-Appl; Support: Fed. \$38,000; Info.	209
210	<u>OHIO</u> - Robert A. Taft Sanitary Engineering Center, Cincinnati Biological Oxidation Bed Studies Ralph Porges; Bas; Support: Fed. \$36,000; Info.	210

211	<u>OHIO</u> - Robert A. Taft Sanitary Engineering Center, Cincinnati Stream Pollution by Radioactive Wastes From Uranium Ore Refineries E. C. Tsivoglou; Appl; Support: Fed. \$15,000; Info.	211
212	<u>OHIO</u> - Robert A. Taft Sanitary Engineering Center, Cincinnati Anaerobic Contact Process - Complete Treatment of Domestic Sewage Jack L. Witherow; Appl; Support: Fed. \$18,798; Info.	212
213	<u>OHIO</u> - Robert A. Taft Sanitary Engineering Center, Cincinnati Treatment Processes for Small Water Supplies L. J. McCabe; Appl; Support: Fed. \$40,000; Info.	213
214	<u>OHIO</u> - Robert A. Taft Sanitary Engineering Center, Cincinnati Filtration Experiments for Water Treatment Processes Gordon G. Robeck; Appl; Support: Fed. \$20,000; Info.	214
215	<u>OHIO</u> - Robert A. Taft Sanitary Engineering Center, Cincinnati Removal of Coliform Organisms in Water Treatment Processes Graham Walton; Appl; Support: Fed. \$7,500; Info.	215
216	<u>OHIO</u> - Robert A. Taft Sanitary Engineering Center, Cincinnati Conservation and Reuse of Water Graham Walton; Appl; Support: Fed. \$12,500; Info.	216
217	<u>OHIO</u> - University of Cincinnati, Cincinnati Taste and Odor Study of Water J. Cholak; Bas-Appl; Support: State \$18,500; Info.	217
218	<u>OHIO</u> - University of Cincinnati, Cincinnati Chloride Uptake by Algae Wm. E. Gates; Bas-Appl; Support: U. of Cincinnati \$2,000; Info.	218
219	<u>OHIO</u> - University of Cincinnati, Cincinnati Polarographic Determination of Dissolved Oxygen LeRoy Reuter; Bas-Appl; Support: U. of Cincinnati \$1,000; Info.	219
220	<u>OHIO</u> - University of Cincinnati, Cincinnati Algal-Bacterial Symbiosis in a Closed System John Pfeffer; Bas-Appl; Support: U. of Cincinnati \$2,000; Info.	220

221	<u>OHIO</u> - University of Toledo, Toledo Application of Dolomite Lime in the Treatment of Water Robt. E. Martin; Bas-Appl; Support: Finishing Lime Assoc. of Ohio; Info.	221
222	<u>OKLAHOMA</u> - Oklahoma City Water Department, Oklahoma City Lake Hefner Evaporation Reduction Studies M. B. Cunningham; Bas-Appl; Support: State-Local; Info.	222
223	<u>OKLAHOMA</u> - Oklahoma State Department of Health, Oklahoma City Isolation of Virus in a Municipal Water Supply Reservoir F. R. Hassler; Bas; Support: Fed.-Local; \$9,000; Info.	223
224	<u>OKLAHOMA</u> - Oklahoma State University, Stillwater Toxicity Bioassay of Oil Refinery Wastes Troy C. Dorris; Bas-Appl; Support: Okla. Oil Refiners Waste Control Council \$12,788; No info.	224
225	<u>OKLAHOMA</u> - University of Oklahoma, Norman Development of Water Quality Criteria for the State of Oklahoma Geo. Reid; Bas-Appl; Support: State; Info.	225
226	<u>OKLAHOMA</u> - University of Oklahoma, Norman Use of Chelates in Brine Stabilization Geo. Reid; Bas-Appl; Support: Fed. Bureau of Mines; Info.	226
227	<u>OREGON</u> - Oregon State College, Corvallis Toxicological - Physiological Effects of Wastes on Aquatic Life Peter Doudoroff; Bas-Appl; Support: Fed. and Ore. State College \$30,000; Info.	227
228	<u>OREGON</u> - Oregon State College, Corvallis Aquatic Biology Aspects of Stream Pollution Chas. E. Warren; Bas-Appl; Support: Fed., Industry and Ore. State College \$23,000; Info.	228
229	<u>OREGON</u> - Oregon State College, Corvallis The Disposal of Sulfite Pulping Effluents Isaiah Gellman; Bas-Appl; Support: Natl. Council for Stream Improvement \$9,000; Info.	229
230	<u>OREGON</u> - Oregon State College, Corvallis Resistance of Marine Animals to Various Pollutational Conditions R. E. Dimick; Bas-Appl; Support: Fed. RG; National Council for Stream Improvement and Ore. Agric. Experiment Sta. \$20,000; Info.	230

231	<u>OREGON</u> - Oregon State College, Corvallis Road Building and Logging Effects on Erosion, Sedimentation, etc. Robt. H. Ruth; Bas-Appl; Support: State Forest Service; Info.	231
232	<u>OREGON</u> - Oregon State College, Corvallis Physical, Chemical, Biological Aspects of Deep Trickling Filters Fred Merryfield; Bas-Appl; Support: State & Ore. State College Engrg. Experiment Sta.; Info.	232
233	<u>OREGON</u> - Oregon State College, Corvallis Deep Trickling Filter Study Ore. State Coll. Engrg. Experiment Sta.; Bas-Appl; Support: State and Ore. State Coll. \$5,050; Info.	233
234	<u>OREGON</u> - Oregon State College, Corvallis Sewage Oxidation Lagoon Project Fred J. Burgess; Appl; Support: State, Ore. State College and City of Corvallis \$9,385; Info.	234
235	<u>PENNSYLVANIA</u> - Academy of Natural Sciences, Philadelphia Biological Survey of Tidal Estuary of the Delaware River Ruth Patrick; Bas-Appl; Support: Fed. and Interstate Comm. on Del. River Basin \$17,500; Info.	235
236	<u>PENNSYLVANIA</u> - Academy of Natural Sciences, Philadelphia Environment and Toxicity of Compounds to Aquatic Life Ruth Patrick; Bas-Appl; Support: Fed. RG \$14,286; Info.	236
237	<u>PENNSYLVANIA</u> - Academy of Natural Sciences, Philadelphia Studies of Recovery of Polluted River Water Ruth Patrick; Bas-Appl; Support: Fed. and Interstate Comm. on Del. River Basin; Info.	237
238	<u>PENNSYLVANIA</u> - Academy of Natural Sciences, Philadelphia Effect of ABS in Water on Aquatic Life H. Radycliffe Roberts; Appl; Support: Assoc. of Amer. Soap & Glycerine Producers \$2,000; Info.	238
239	<u>PENNSYLVANIA</u> - Lehigh University, Lehigh Instruments to Analyze Delaware River Water Quality Geo. W. Jenkins; Bas-Appl; Support: Fed. and Interstate Comm. on Del. River Basin \$10,000; Info.	239
240	<u>PENNSYLVANIA</u> - Lehigh University, Lehigh Neutralization of Bottom Muds and Waters by Alkaline Stack Dusts Geo. W. Jenkins; Bas; Support: Fed. and Interstate Comm. on Del. River Basin \$12,500; Info.	240

241	<u>PENNSYLVANIA</u> - Mellon Institute, Pittsburgh Study of Sedimentation Emphasizing Flue Dust and Mill Scale Richard D. Hoak; Bas-Appl; Support: Amer. Iron and Steel Inst; Info.	241
242	<u>PENNSYLVANIA</u> - Mellon Institute, Pittsburgh The Origin of Tastes and Odors in Drinking Water Richard D. Hoak; Bas; Support: Amer. Iron and Steel Inst.; Info.	242
243	<u>PENNSYLVANIA</u> - Pennsylvania State University, University Park Aerobic Metabolism of Cyanogenic Compounds John B. Nesbitt; Bas; Support: Fed. RG \$8,000; Info.	243
244	<u>PENNSYLVANIA</u> - Pennsylvania State University, University Park Design Criteria for Total Oxidation Activated Sludge Treatment R. Rupert Kountz; Bas-Appl; Support: Fed. RG \$15,000; Info.	244
245	<u>RHODE ISLAND</u> - Rolf Eliassen Associates, Inc., Cranston Plant Scale Study of Complete-Mixing Activated Sludge Process Ross E. McKinney; Appl; Support: State and Assoc. of Amer. Soap & Glycerine Producers \$17,000; Info.	245
246	<u>TENNESSEE</u> - Tennessee Department of Public Health, Nashville Preservation of Enteric Organisms with Chelating Agents Ernest L. Shihe; Bas-Appl; Support: Fed. RG \$10,000; Info.	246
247	<u>TEXAS</u> - Baylor University, Waco Toxic Properties of the Blue-Green Algae Floyd F. Davidson; Bas-Appl; Support: Fed. RG; Info.	247
248	<u>TEXAS</u> - North Texas State College, Denton Chemical and Physical Quality of Lake Texoma Water J. K. G. Silvey; Bas; Support: Fed. \$1,890; Info.	248
249	<u>TEXAS</u> - North Texas State College, Denton Nutritional Requirements of Aquatic Actinomycetes J. K. G. Silvey; Bas; Support: Fed. RG \$14,400; Info.	249
250	<u>TEXAS</u> - University of Texas, Austin Ground Water Recharge as Affected by Phosphate Solubilities Earnest F. Gloyna; Bas; Support: Industrial Organization; No info.	250

251	<u>TEXAS</u> - University of Texas, Austin Low-Level Radioactivity Background Survey Earnest F. Gloyna; Bas-Appl; Support: Fed. AEC \$10,800; Info	251
252	<u>TEXAS</u> - University of Texas, Austin Reactor Fuel Waste Disposal - Salt Cavity Type Earnest F. Gloyna; Bas-Appl; Support: Fed. AEC \$20,000; Info.	252
253	<u>TEXAS</u> - University of Texas Medical Branch, Galveston Disinfection of Sewage and Sewage Sludges by Halogens C. H. Connell; Bas-Appl; Support: Fed. RG \$11,000; Info.	253
254	<u>UTAH</u> - University of Utah, Salt Lake City Oxidation Pond Characteristics - Raw Domestic Sewage Grant K. Borg; Bas-Appl; Support: State \$6,000; Info.	254
255	<u>UTAH</u> - Utah State University, Logan Effects of Fluorides on Fish Wm. F. Sigler; Bas; Support: Fed. RG \$12,995; Info.	255
256	<u>UTAH</u> - Utah State University, Logan Water Supplies and Utilization in Various Utah Counties Jay M. Bagley; Appl; Support: State; Info.	256
257	<u>VERMONT</u> - University of Vermont, Burlington Nutritional Requirements of <i>Kirchneriella Subsolitaria</i> Milton Potash; Bas; Support: Fed. RG \$6,325; Info.	257
258	<u>VERMONT</u> - University of Vermont, Burlington Value of Whey When Used on Soil and Crops A. R. Midgley; Bas-Appl; Support: State and U. of Vt. \$5,500; Info.	258
259	<u>VIRGINIA</u> - Virginia Polytechnic Institute, Blacksburg Resistance of Bituminous Fibre Pipe Joints to Root Penetration W. A. Parsons; Appl; Support: Bituminous-Fibre Pipe Inst. \$6,000; Info.	259
260	<u>VIRGINIA</u> - Virginia Polytechnic Institute, Blacksburg Analysis and Treatment of Semi-Chemical Pulping Effluents Millard H. Robbins; Appl; Support: Natl. Council for Stream Improvement \$9,624; Info.	260

261	<p><u>WASHINGTON</u> - Washington State University, Pullman  Some Characteristics of Anaerobic Digestion  G. H. Dunstan; Bas-Appl; Support: Fed. RG and Wash. State U.  \$9,000; Info.</p>
262	<p><u>WASHINGTON</u> - Washington State University, Pullman  Sewage Oxidation Ponds in Washington  G. H. Dunstan; Appl; Support: Consulting Engr. and Wash. State U.  \$1,500; Info.</p>
263	<p><u>WASHINGTON</u> - Washington State University, Pullman  Study of Sphaerotilus in Irrigation Water  G. H. Dunstan; Bas-Appl; Support: City of Walla Walla and Wash. State U.  \$5,000; Info.</p>
264	<p><u>WASHINGTON</u> - University of Washington, Seattle  Data Collection in Marine Waters Adjacent to Manufacturing Area  Clifford A. Barnes; Bas; Support: State \$1,200; Info.</p>
265	<p><u>WASHINGTON</u> - University of Washington, Seattle  Large Lake Fertilized With Sewage Treatment Plant Effluent  W. T. Edmondson; Bas; Support: Fed. RG \$10,421; Info.</p>
266	<p><u>WASHINGTON, DISTRICT OF COLUMBIA</u> - Georgetown University, Washington  Radioactive Isotope Technique for Detection of Coliforms  Walter C. Hess; Bas-Appl; Support: Fed. RG \$20,000; Info.</p>
267	<p><u>WISCONSIN</u> - American Society of B  Increasing In-Plant Recover  Alex Sigal; Appl; Support:</p>
268	<p><u>WISCONSIN</u> - Red Dot Foods, Mad  Waste Disposal  Ken Sellers; Appl; Suppo:</p>
269	<p><u>WISCONSIN</u> - Sulphite Pulp Manu  Cooperative Stream Studi  A. J. Wiley; Appl; Suppo  Mfrs. Res'ch League; \$7,</p>
270	<p><u>WISCONSIN</u> - Sulphite Pulp Manu  Saline Water Conservatio  A. J. Wiley; Bas-Appl; S  League; Info.</p>



271

WISCONSIN - Sulphite Pulp Manufacturers' Research League, Appleton  
Basic Research on Lignin Components of Spent Sulphite Liquor  
Irwin Pearl; Bas; Support: Sulphite Pulp Mfrs. Research League  
\$27,000; Info.

271

272

WISCONSIN - Sulphite Pulp Manufacturers' Research League, Appleton  
Applied Research on Lignin Components of Spent Sulphite Liquor  
Julius Benko; Bas-Appl; Support: Sulphite Pulp Mfrs. Res'ch  
League \$16,750; Info.

272

273

WISCONSIN - Sulphite Pulp Manufacturers' Research League, Appleton  
Research on Carbohydrates of Spent Sulphite Liquor  
Lawrence A. Boggs; Bas-Appl; Support: Sulphite Pulp Mfrs.  
Res'ch League \$27,000; Info.

273

274

WISCONSIN - University of Wisconsin, Madison  
Stabilization Pond Studies  
G. A. Rohlich; Bas-Appl; Support: Oscar Mayer & Co., Rockefeller  
Foundn., and U. of Wisc. Alumni Res'ch Foundn.; Info.

274

275

WISCONSIN - University of Wisconsin, Madison  
Thermophilic Digestion of Activated Sludge  
G. A. Rohlich; Bas; Support: U. of Wisc. Alumni Res'ch Foundn.  
\$2,320; Info.

275

276

WISCONSIN - University of Wisconsin, Madison  
Use of Aeration in the Conditioning of Sewage Sludges  
G. A. Rohlich; Bas-Appl; Support: Walker Process Equipment Co.  
\$2,850; Info.

276

277

WISCONSIN - University of Wisconsin, Madison  
Spray Irrigation of Dairy Wastes  
L. E. Engelbert; Appl; Support: Fed. U.S.D.A. \$5,400; Info.

277

WISCONSIN - University of Wisconsin, Madison  
Frothing in Sewage Treatment  
G. A. Rohlich; Bas-Appl; Support: Assoc. of Amer. Soap &  
Glycerine Producers \$12,000; Info.

278

WISCONSIN - University of Wisconsin, Madison  
Effect of Algae on BOD Measurements  
Geo. P. Fitzgerald; Bas; Support: Fed. RG \$12,600; Info.

279

WISCONSIN - University of Wisconsin, Madison  
Effect of Pollutants on Fish Flavor  
Dorothy Strong; Bas; Support: State \$5,150; Info.

280

## ANALYSIS OF DATA IN RESEARCH PROJECT LIST

The following is a brief analysis of the information contained in the preceding project list. This year's listing of 280 projects represents work that is being conducted in 38 of the 50 states and the District of Columbia. As might be expected, the research is fairly heavily concentrated in a small number of states. The 12 states reporting the most projects accounted for 167, or nearly 60% of the total. The total figure includes Ohio, with the exception of the 23 projects at the Public Health Service Sanitary Engineering Center located in that state.

Table 1 presents a classification of water supply and pollution control research on the basis of institutions and organizations in which the research work is being done. As can be immediately seen, most of the research in this field is being done at universities, while other types of organizations take a comparatively small part in direct research activities. The bulk of research people in this field are in the schools, and this fact explains the heavy concentration of research there.

Table 1

### NUMBER OF RESEARCH PROJECTS CONDUCTED IN INSTITUTIONS AND ORGANIZATIONS

	<u>No. of Projects</u>	<u>Per cent</u>
Universities	205	73.2%
State and Interstate Agencies	25	8.9%
Federal Agencies	23	8.2%
Industrial Organizations	17	6.1%
Local Agencies	<u>10</u>	<u>3.6%</u>
Total	280	100.0%

While institutions other than universities have a rather small direct role in conducting research, they make a considerable indirect contribution to supporting research in water supply and pollution control. Table 2 lists institutions and organizations and shows the amount of money from each of these sources supporting water supply and pollution control research. Since the reporting of the amount of support was voluntary, the total reported figures did not include all of the 280 projects listed in the Inventory. Table 2 presents the amount of money determined by prorating the average amount reported per project over the total number of projects supported by each source.

While the bulk of the research in this field is being conducted at universities, most of its support is coming from sources other than university budgets and special funds. Federal agencies, State agencies, and industrial organizations account for the largest amount of support. The figure for Federal Agencies includes funds from sources other than the Public Health Service. In addition, there were a small number of grants from private individuals which have not been included because the amount represented was insignificant.

TABLE 2

AMOUNT OF RESEARCH PROJECT SUPPORT BY  
INSTITUTIONS AND ORGANIZATIONS

	<u>Amount</u>	<u>Per cent</u>
Universities	\$ 143,000	4.1%
State Agencies	928,000	26.5%
Federal Agencies	1,878,000	53.6%
Industrial Organizations	464,000	13.3%
Local Agencies	<u>87,000</u>	<u>2.5%</u>
Total	3,500,000	100.0%

This first analysis must, because of its newness, be limited in scope. In future years, comparisons and trends will doubtless be indicated and it is hoped that this publication will provide people in the field of water supply and pollution control research with at least an annual "thumb-nail sketch" of activities and trends. Analysis may be done in the future on the people involved in this research, in terms of their professional specialties. Such data would point out the importance of inter-disciplinary cooperation and would be valuable in determining the future needs of various specialties. In addition, analysis will be done on the areas in which research is being conducted in the field of water supply and pollution control. The Subject Index which follows gives an overall view of this aspect, but more detailed information might also become a guide to where research in this field is going, and where it needs, perhaps, to be increased.



## 2

*Subject Index*  
BY RESEARCH AREASUBJECT INDEX

The second section of the Research Inventory provides a working reference index for use in locating projects in the Project List. The number to the right of each reference title is the number given each project in the Project List (Section 1).

This Subject Index was designed to include only those subjects or research areas which are important because they are well represented in the group of projects reported.

The following is a list of the basic research areas contained in the index. Sub-headings of a number of these will be found in the index itself.

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## ANALYSIS

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- Coliforms & enterococci as indices of water quality - 94
- Enterococci as indicators of pollution - 142
- Improvement of molecular membrane bacteriological techniques - 117
- Shigella dysentery in irrigation water - 24

### BIOCHEMICAL:

- B.O.D. of pure organic compounds - 144
- Characteristics of synthetic detergents - 123
- Effect of algae on B.O.D. measurements - 279
- Versene to eliminate effect of metals on B.O.D. - 35

### BIOLOGICAL:

- Aquatic biology aspects of stream pollution - 228
- Assay of Louisiana sugar mill wastes - 103
- Survey of tidal estuary of Delaware River - 235

### CHEMICAL:

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- Assay of Louisiana sugar mill wastes - 103
- Cyanogen chloride to determine residual chlorine in wastes - 146
- Effect of chemical variables on reaeration - 167
- Kinetics & mechanism of reactions involving chlorine dioxide - 179
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- Quality of Lake Texoma (Texas) water - 248
- Short method for determining ABS in water & sewage - 21

### CHROMATOGRAPHIC:

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- Identification of organic acids in

### ELECTRICAL:

- Coliform bacteria detection with e
- Digital computer estimation of res
- Study of surface precipitation usd

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## ANALYSIS (cont.)

### GENERAL STUDIES:

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- Application of bioassays - 200
- Data collection in marine waters adjacent to manufacturing area - 264
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- Lake Whitney (Connecticut) sanitary conditions vs. lab exams - 41
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- Stream analysis & hydrology - 137
- Taste & odor compounds from algae & actinomycetes - 207
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- Effect of physical variables on reaeration - 167
- Kinetics & mechanism of reactions involving chlorine dioxide - 179
- Quality of Lake Texoma (Texas) water - 248

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- Determination of dissolved oxygen - 219

### RADIOACTIVE:

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- Determining isotopes in water & sewage - 139
- Isotope technique for detection of coliforms - 266
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- Development of vertical screen trickling filter - 132
- Factors in construction & operation of sewage oxidation ponds - 174
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- Effectiveness of milk waste treatment plants - 169
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- Meat packing waste disposal - 92
- Potato chip waste disposal - 268
- Recovery of wastes in distillers dried feeds - 184
- Spray irrigation for dairy wastes - 277
- Treatment of chicken processing wastes - 54
- Treatment of "protein water" from potato starch manufacture - 109
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- Bacterial oxidation of nitrite - 47
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- Effect of temperature on digestion - 82
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- Synthetic detergent ABS measurement - 21
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- Dairy wastes - 37
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- Design criteria for total oxidation activated sludge treatment - 244
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- Duck farm wastes - 160
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- Fatty acid transformation in anaerobic digestion by C14 tagging - 145
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- Kraft mill waste treatment for removal of color - 101
- Lime neutralization of dilute acid wastes - 148
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- Behavior of nitriles in treatment systems & surface water - 198
- Cholinesterase activity of fish brain tissue - 178
- Coagulation of colloids having amino groups - 181
- Cyanogen chloride for determining residual chlorine in wastes - 146
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## OXYGEN

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### BIOCHEMICAL DEMAND:

- B.O.D. of pure organic compounds - 144
- Effect of algae on B.O.D. measurements - 279
- Use of Versene to eliminate effect of metals on B.O.D. - 35

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- Kraft mill waste treatment for removal of color - 101
- Lignin components of spent sulphite liquor-applied study - 272
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- Pulp mill location related to fish population - 175
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- Fission waste disposal by adsorption of isotopes on soil-sawdust - 111
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## *Address List* FOR INFORMATION

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The third section of the Research Inventory comprises a list of the names and addresses of those reporting the research projects in this survey. It will be noted that the reporter is not always the principal investigator for a given project. Reporters are assumed to be familiar with the details of research projects and to be the logical source of available information.

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